Contagious political concerns: Identifying unemployment shock information transmission using the Danish population network

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Social networks explain life experiences

Neighbors influence socioeconomic outcomes (Chetty et al. 2016).

Peers facilitate the diffusion of microfinance (Banerjee et al. 2013).

Roommates influence choice of major and exam performance (Sacerdote 2001).

Obese friends increase obesity (Christakis and Fowler 2007).

Social networks, beliefs and preferences

At least three channels through which social networks influence economic and political beliefs and preferences:

- Pressure to conform (Gerber et al. 2008; Sinclair 2012).
- Coordination, through explicit interaction or second-order beliefs (Chwe 2000; Kuran 1991).
- Information transmission (Downs 1957; Huckfeldt and Sprague 1995).

We focus on peer-to-peer information transmission.

- Low voter political information entail big potential effects.
- Limited attention.
- Doubt over its importance relative to social pressure (Sinclair 2012).

Research question

Does information about unemployment shocks transmitted through social networks affect individual economic and political beliefs and preferences?

Test pocketbook and sociotropic implications (Iversen and Soskice 2001; Moene and Wallerstein 2001).

- Do shocks to other affect a voters' own concerns, or evaluation of national economy?
- Does this affect preferred policies?
- Does this affect vote choice?

Empirical challenges

Incomplete network map: omitted links can induce bias.

Correlated shocks.

Reflection problem.

Distinguishing information from behavioral conformity.

Empirical design

Examine effects of unemployment shock information in Denmark.

Combine rich Danish register data with a panel political survey.

- Helps address incomplete networks.

Unemployment shocks to "friends of friends" isolate information transmission through peers.

- Helps address reflection problem, correlated shocks, and distinguishing information from conformity.

Geographically restrict shocks, fine-grained fixed effects, and "first stage" support information transmission.

- Help address correlated shocks and support interpretation.

Main findings

Unemployment shocks to friends of friends increase:

- Subjective and national unemployment concerns.
- Support for social insurance policies to address unemployment.
- Voting for left-wing parties.

Mechanisms support information transmission and self-interest:

- Intermediaries respond similarly with 5x greater magnitude.
- Results almost entirely reflect shocks to people in the same industry, suggesting self-interest and that large intermediary response reflects closeness more than decay.
- Shocks to people in the same industry do not differentially affect national outlook.

Roadmap

(1) Danish context.

(2) Empirical strategy (and implementation).

(3) Results (and thinking about robustness).

(4) Mechanisms.

(5) Conclusions.

Danish context

Danish political context

Denmark in the post-financial crisis years 2010-2013.

Historically competitive left-right PR system. Left coalition narrowly defeated 10-year right incumbent coalition in September 2011.

99 municipalities containing c.2,200 parishes.

Debate over unemployment

Rising unemployment a key electoral issue:

- Unemployment trebled from 2% in 2008 to 6% by 2011.
- 40% cited unemployment and welfare state as biggest issue.
- Unemployment remained at 6-7%, biggest issue in 2013.

Major debate over Denmark's generous UI.

- Insurance comes from government and voluntary system.
- Voluntary insurance duration reduced from 4 to 2 years in 2010 (starting 2012)
- Right government also cut taxes.
- Left's "fair solution" proposed public investment and return to UI system.

Ideological positions of main parties known to most voters.

Population of 5.5m with strong informal social ties

Workplace and education form basis of social interactions.

Declining union relevance (esp. for discussion) and 3-4% church attendance.

High contact (EC 2004):

- 64% have contact with friends at least once a week.
- 44% meet colleagues outside of work at least once a month.

Networks also provide information (EC 2004):

- 52% rely on network for help with paper work (e.g. taxes).
- 73% discuss private problems, 40% borrow money.
- Former co-workers aid re-employment (Glitz and Vejlin 2014).

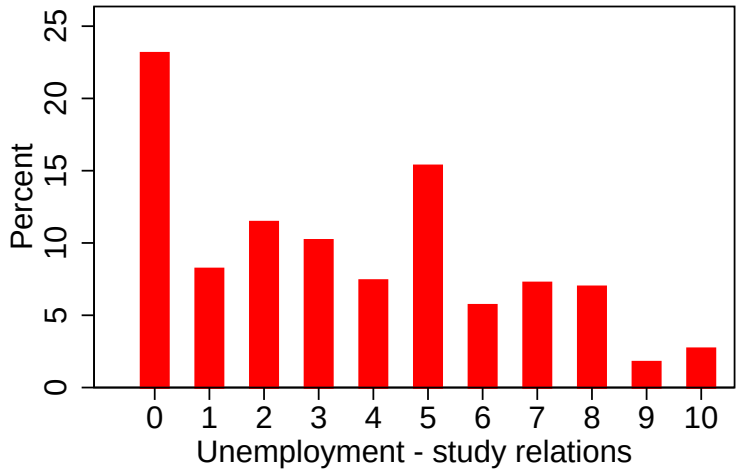
Stability and mobility

Relatively low geographical mobility (key for identification):

- 15% changed address in 2014.
- ...of which 35% changed municipality.
- Live at home through 20-22; school cohorts remain influential.

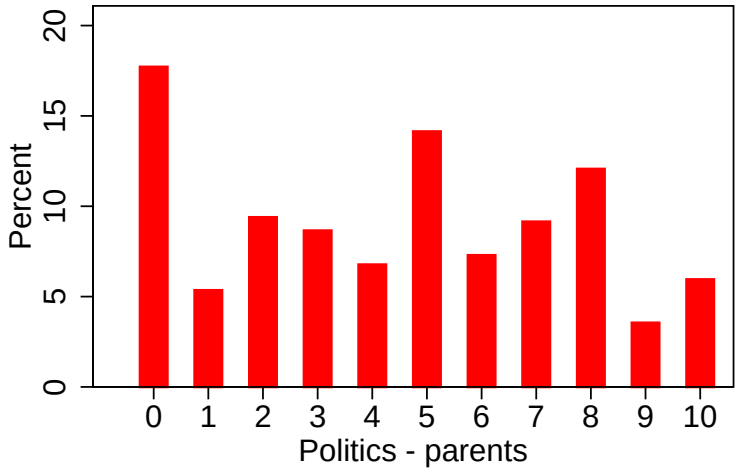
Talking about unemployment (never-often)

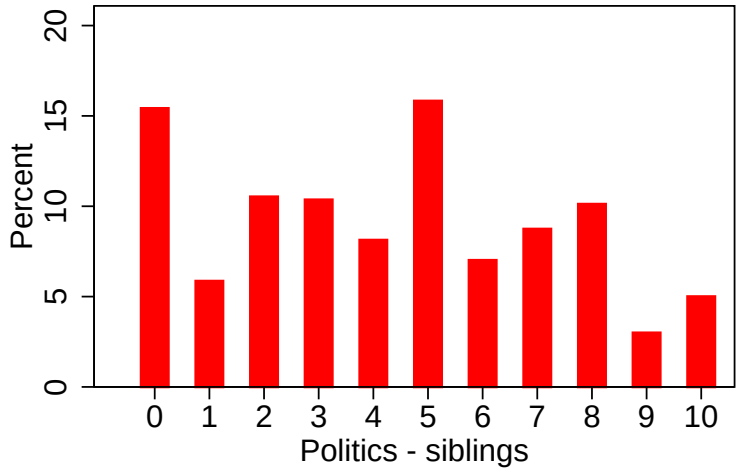
Who do you talk to about unemployment?

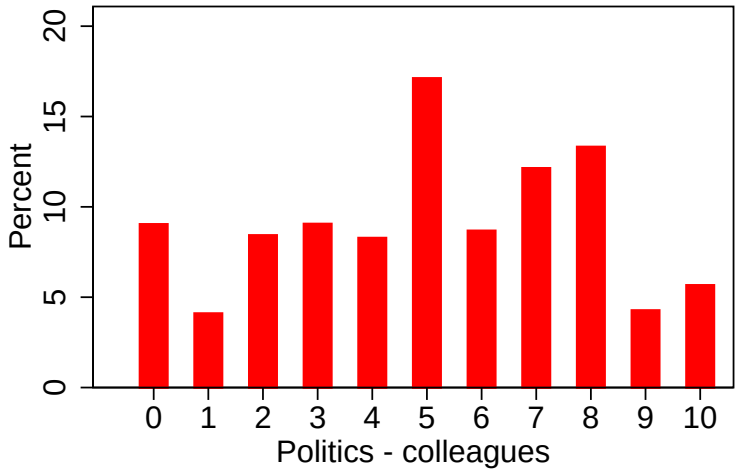


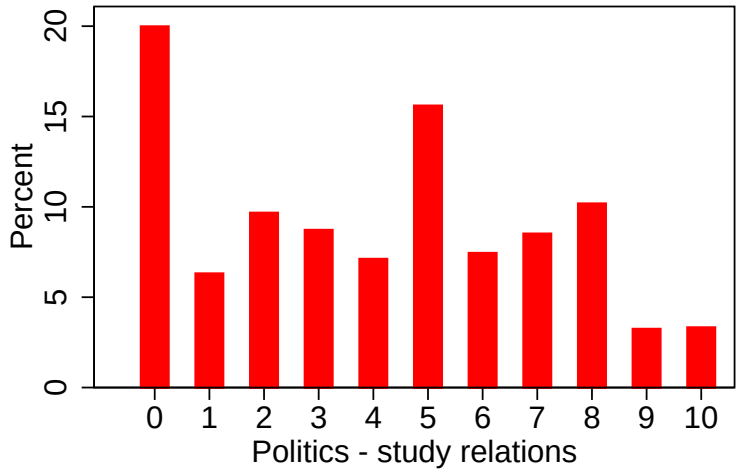
Talking about politics (never-often)

Who do you talk to about politics?









Empirical strategy

Data

Extraordinarily rich administrative register dataset:

- 8m living Danes, 1980-2012.
- Data across government department including employment.
- Family, firm and education histories.

6,000-person annual panel survey, 2010-2013 (Kreiner et al. 2013):

- January-February every year.
- 8,747 working age respondents linked to register.

Outcomes

Own unemployment risk: probability from 0 to 100% of becoming unemployed over forthcoming year (mean of 13.8).

National unemployment outlook:

- Best guess at current national rate (8.5).
- Forecast for national rate over forthcoming year (7.6).

Policy preference indicators:

- Increase unemployment insurance above existing level (31%).
- Government should do more to support the poor (39%).
- Need non-market based solutions to economic crises (42%).

Vote choice indicators:

- Intend to vote a left-wing party (SD, SL, SP, R-G).
- Voted for left-wing party in 2011.

Unemployment shocks

Becoming unemployed:

- Individual was unemployed in November prior to survey...
- ...but was employed in the prior November.
- (Ignore duration or number of instances.)

3% of working age Danes experience such a shock a year.

Likely to be medium-term responses.

Defining social networks

Comprehensive network of *weak* ties.

- Reduce concern about omitted connections subject to shocks.
- Unemployment information likely transfers between weak ties.
- Probably underestimates effects though.

First-degree network connections defined by:

- **Familial**: parents, siblings, partner, partner's parents.
- **Educational**: graduating cohort from most recent educational institution.
- **Vocational**: coworkers from within the previous two years; only coworkers within same 1-digit educational category for (1) firms with more than 25 employees or (2) for workers with more than 50 coworkers over two years.

Creating the adjacency matrix

Education (or vocation) ties (also sibling and partner family):

$$E \equiv \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \end{bmatrix} \quad E'E = \begin{bmatrix} 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \end{bmatrix}$$

Combining with family connections:

$$F \equiv \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix} \quad A \equiv F + (E'E - I) = \begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \end{bmatrix}$$

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$$F \equiv \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix} \quad A \equiv F + (E'E - I) = \begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \end{bmatrix}$$

Identification strategy

Goal: estimate how an unemployment shock to k is transmitted through j to affect i.

Bramoullé et al. (2009) approach, absent instrumenting.

Friends of friends (k) capture information j has that i does not.

- Helps to mitigate common shocks.
- Prevents conformity pressures arising direct interaction.

Exploiting *shocks* addresses directionality (reflection problem).

Restrict second-degree connections to address correlated shocks.

Identifying second-degree connections

Create second-degree connections (number on diagonal):

$$A'A = \begin{bmatrix} 2 & 1 & 1 & 1 & 0 \\ 1 & 3 & 0 & 1 & 1 \\ 1 & 0 & 2 & 0 & 0 \\ 1 & 1 & 1 & 2 & 0 \\ 0 & 1 & 0 & 0 & 1 \end{bmatrix} \quad S \equiv A'A - diag(A) = \begin{bmatrix} 0 & 1 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

Creating "intransitive triads": remove second-degree that are also first-degree connections:

$$SD \equiv \max\{S - A, 0\} = \begin{bmatrix} 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

Identifying second-degree connections

Create second-degree connections (number on diagonal):

$$A'A = \begin{bmatrix} 2 & 1 & 1 & 1 & 0 \\ 1 & 3 & 0 & 1 & 1 \\ 1 & 0 & 2 & 0 & 0 \\ 1 & 1 & 1 & 2 & 0 \\ 0 & 1 & 0 & 0 & 1 \end{bmatrix} \quad S \equiv A'A - diag(A) = \begin{bmatrix} 0 & 1 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

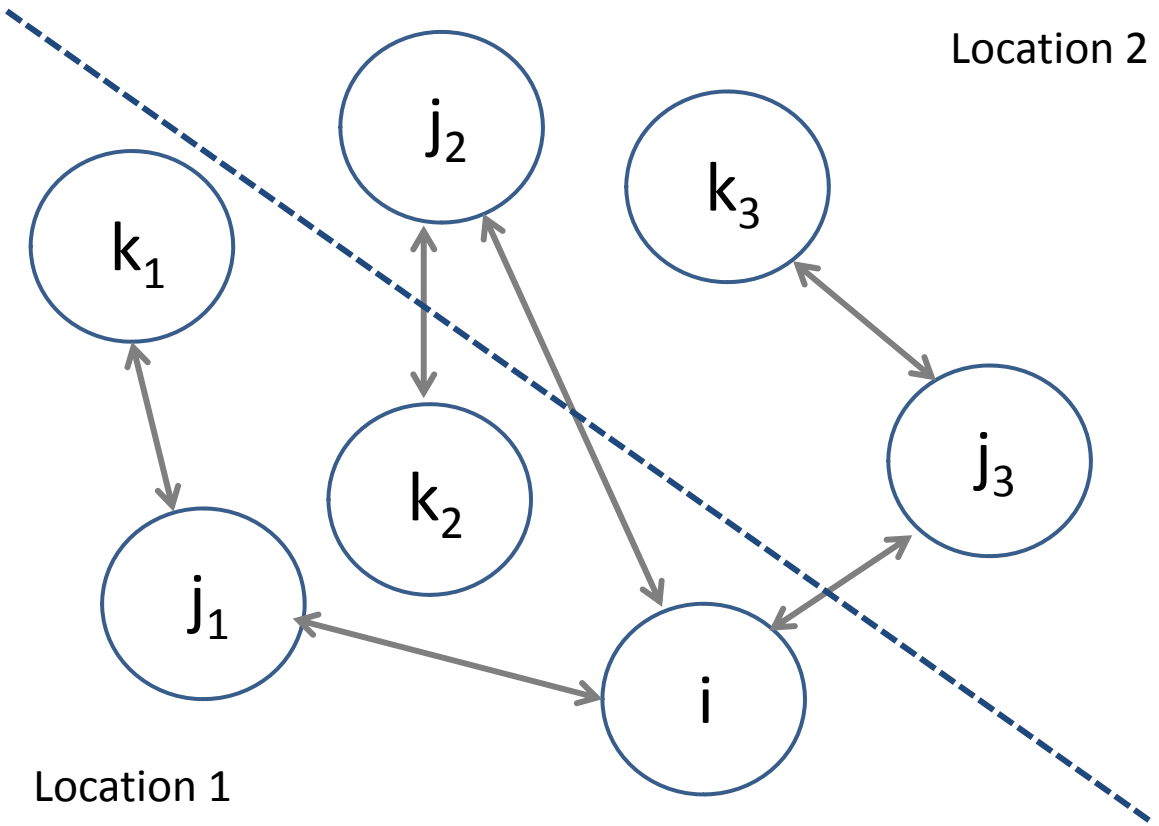
Creating "intransitive triads": remove second-degree that are also first-degree connections:

$$SD \equiv \max\{S - A, 0\} = \begin{bmatrix} 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

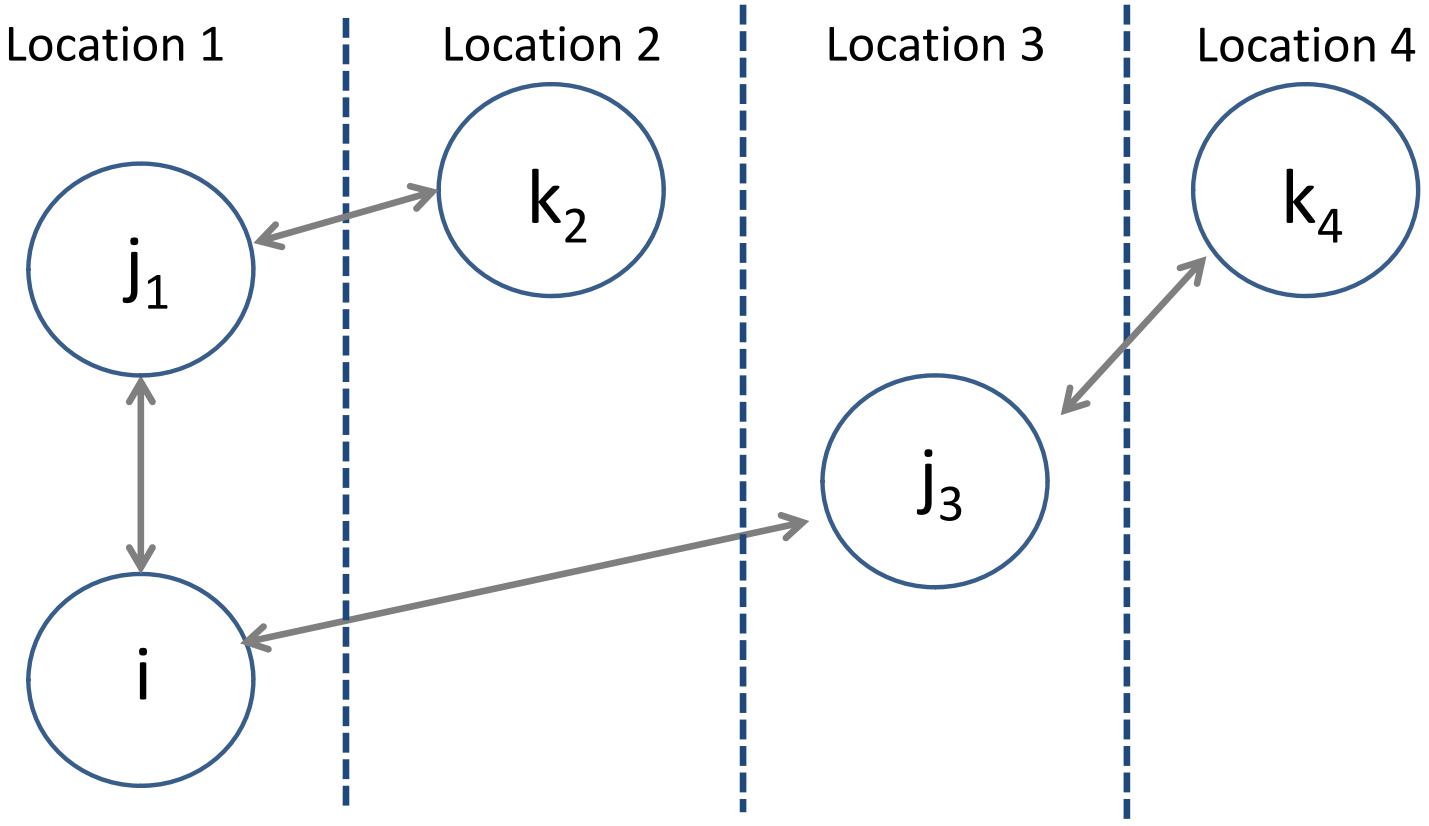
Spatial correlation concerns

Remove more than half friends of friends to address:

- Spatially correlated shocks (k_1 and k_2). By municipality.
- Correlated information affecting j (k_3). By parish.



Included cases



Danish population, 1980-2012

7.97m $\times$ 7.97m adjacency matrix, with mean 241 and median 88 first-degree connections.

Mean 7,130 and median 4,364 second-degree connections: "friends of friends." Assign unemployment shocks to each.

Focus on only 8,747 labor force participants that appear at least once in our panel survey.

Summary statistics, 2010-2013

	Full population, aged 20-65		Survey respondents		Respondents' first-degree connections		Respondents' second-degree connections	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Woman	0.50	0.00	0.49	0.16	0.54	1.00	0.51	1.00
Age	42.9	43.0	45.7	46.4	43.5	44.0	42.3	42.7
Children	0.78	0.00	1.01	1.00	0.97	1.00	0.86	0.00
Single	0.35	0.00	0.21	0.00	0.26	0.00	0.32	0.00
Gross income (DKK)	325,251	294,646	403,680	362,382	432,486	379,042	364,075	329,481
Total assets (DKK)	848,888	375,907	1,256,176	808,325	1,117,726	777,658	949,692	562,529
Total debt (DKK)	635,145	271,566	849,482	563,955	826,296	597,285	726,920	427,722
Homeowner	0.49	0.00	0.68	1.00	0.63	1.00	0.55	1.00
Education basic	0.33	0.00	0.20	0.00	0.09	0.00	0.23	0.00
Education short	0.39	0.00	0.42	0.00	0.41	0.00	0.45	0.00
Education medium	0.16	0.00	0.25	0.00	0.30	0.00	0.21	0.00
Education long	0.08	0.00	0.13	0.00	0.20	0.00	0.10	0.00
Unemployed	0.06	0.00	0.04	0.00	0.03	0.00	0.04	0.00
Unemployment shock	0.04	0.00	0.03	0.00	0.02	0.00	0.03	0.00
Observations	13,385,137	13,385,137	19,709	19,709	1,882,767	1,882,767	9,022,069	9,022,069

Baseline specification

$$Y_{iwoept} = \beta Shock_{kp't} + \zeta_{wt} + \kappa_{ot} + \psi_{et} + \mu_{pt} + \varepsilon_{ikwoepp't},$$

Fixed effects address non-spatial correlated shock concerns:

- Industry (2 digit)-year.
- Occupation (1 digit)-year.
- Education-year.
- Parish-year.

Double cluster by i's municipality and k's municipality (Cameron and Miller 2015).

Weight by $1/\#k$ to weight each response equally.

Balance tests

	Female (lag) (1)	Age (lag) (2)	Children (lag) (3)	Single (lag) (4)	Gross income (DKK) (lag) (5)
Unemployment shock	-0.0007	-0.1016*	0.0024	0.0030**	-812.3394
	(0.0018)	(0.0542)	(0.0045)	(0.0014)	(1,075)
Observations	140,503,346	140,503,346	140,503,346	140,503,346	140,503,346
Outcome range	{0,1}	[22,67]	[0,6]	{0,1}	[-1.5m,1.3m]
Outcome mean	0.59	44.10	1.11	0.20	418,086
Outcome standard deviation	0.49	10.27	1.10	0.40	384,875
Unemployment shock mean	0.02	0.02	0.02	0.02	0.02

	Total assets (DKK) (lag) (6)	Total debt (DKK) (lag) (7)	Homeowner (lag) (8)	Unemployed (lag) (9)	Own unemployment shock (10)
Unemployment shock	-6,922	-4,233	-0.0043***	0.0006	0.0010*
	(7,374)	(3,880)	(0.0010)	(0.0005)	(0.0005)
Observations	140,503,346	140,503,346	140,503,346	140,503,346	140,503,346
Outcome range	[0,8,073,800]	[0,3,988,900]	{0,1}	{0,1}	{0,1}
Outcome mean	1,195,254	775,409	0.68	0.02	0.02
Outcome standard deviation	3,033,311	1,526,923	0.47	0.14	0.13
Unemployment shock mean	0.02	0.02	0.02	0.02	0.02

Results

Effects of unemployment shocks

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment shock	0.3257 ***	0.0834 ***	0.0950 ***	0.0028 **	0.0017	0.0019	0.0030 **	0.0038 **
	(0.0814)	(0.0205)	(0.0252)	(0.0013)	(0.0015)	(0.0027)	(0.0014)	(0.0018)
Observations	140,509,875	105,142,551	69,271,133	140,509,875	140,509,875	35,367,324	140,509,875	41,432,206
Outcome range	[0, 100]	[0, 100]	[0, 100]	{0, 1}	{0, 1}	{0, 1}	{0, 1}	{0, 1}
Outcome mean	13.80	8.49	7.59	0.31	0.39	0.42	0.48	0.54
Outcome standard deviation	26.38	5.43	4.70	0.46	0.49	0.49	0.50	0.50
Unemployment shock mean	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Survey years unavailable		2010	2010, 2012			2011, 2012, 2013		2010, 2011

Computing a meaningful magnitude?

A SD increase in the share of second-degree connections becoming unemployed (1.5 percentage points) for the median respondent with 4,341 second-degree connections entails...

- ...a 21pp increase own unemployment expectation.
- ...19 and 25pp increases in left-wing voting.

Robustness: control for balancing variables

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment shock	0.2344 ***	0.0732 ***	0.0897 ***	0.0027 **	0.0016	0.0014	0.0028 **	0.0040 **
	(0.0742)	(0.0182)	(0.0236)	(0.0013)	(0.0015)	(0.0027)	(0.0014)	(0.0018)
Observations	140,503,346	105,138,075	69,269,674	140,503,346	140,503,346	35,365,271	140,503,346	41,431,095

Robustness: future unemployment shocks placebo

Shocks should only matter if they occur before a respondent answers the survey, but there is substantial serial correlation.

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment shock	0.4142 **	0.0422 *	0.0267	0.0015	0.0033	0.0026	0.0028	0.0004
	(0.1759)	(0.0233)	(0.0312)	(0.0019)	(0.002)	(0.0037)	(0.0024)	(0.0022)
Observations	71,193,616	36,190,226	36,190,226	71,193,616	71,193,616	35,003,390	71,193,616	40,990,984

[Is this an informative placebo? Are we capturing a snapshot?]

Robustness: *k*-level parish-year unemployment

Control for the environment surrounding second-degree connections to address two concerns:

- Parish-level shocks in the location of second-degree connections are correlated with those affecting the respondent.
- Respondents could learn, e.g. through the media, about general unemployment conditions in another area through avenues other than a specific friend of friend's experience.

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment shock	0.3229 ***	0.0818 ***	0.0935 ***	0.0027 **	0.0016	0.0023	0.0029 **	0.0039 **
	(0.0811)	(0.0205)	(0.0252)	(0.0013)	(0.0015)	(0.0026)	(0.0014)	(0.0018)
Parish unemployment rate	0.0053	0.0030	0.0028	0.0003	0.0002	-0.0008 **	0.0001	-0.0002
	(0.0144)	(0.0027)	(0.0032)	(0.0003)	(0.0003)	(0.0004)	(0.0002)	(0.0003)
Observations	140,509,875	105,142,551	69,271,133	140,509,875	140,509,875	35,367,324	140,509,875	41,432,206

Robustness: *k*-level parish-year fixed effects

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment shock	0.3257 ***	0.0834 ***	0.0950 ***	0.0028 **	0.0017	0.0019	0.0030 **	0.0038 **
	(0.0814)	(0.0205)	(0.0252)	(0.0013)	(0.0015)	(0.0027)	(0.0014)	(0.0018)
Observations	140,509,875	105,142,551	69,271,133	140,509,875	140,509,875	35,367,324	140,509,875	41,432,206

Robustness: maximum of 10,000 second degree connections

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment shock	0.2516 **	0.0932 ***	0.1070 ***	0.0024	0.0019	-0.0001	0.0035 **	0.0032
	(0.0984)	(0.0255)	(0.0335)	(0.0015)	(0.0018)	(0.0032)	(0.0018)	(0.0022)
Observations	48,485,869	35,587,318	23,678,186	48,485,869	48,485,869	12,898,551	48,485,869	13,995,844

Robustness: maximum of 5,000 second degree connections

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployment shock	0.2539 **	0.1004 ***	0.1258 ***	0.0007 0	0.0020 0	-0.0048 0	0.0050 **	0.0061 **
	(0.1229)	(0.0357)	(0.0487)	(0.0018)	(0.0019)	(0.004)	(0.0019)	(0.0029)
Observations	18,558,169	13,624,764	9,031,075	18,558,169	18,558,169	4,933,405	18,558,169	5,372,314

More checks to come

Use survey data to test which types of tie are strongest, and whether that is consistent with i's survey response.

Placebo tests:

- No effect of k's connected to i through a type of j that i never talk about unemployment and politics with.
- Use similar fake j's to replace real j's.

k fixed effects to exploit temporal variation.

Controlling for vocational network truncation.

[Anything else?]

Mechanisms

Transmission through first-degree connections

Ideally examine k to j, but little data on j's.

Akin to TS2SLS, examine j on i.

	Own unemployment expectation (1)	Guess national unemployment rate (2)	National unemployment rate expectation (3)	Want more unemployment insurance (4)	Government should support the poor (5)	Support non-market based solutions (6)	Intend to vote for left party (7)	Voted for left party in 2011 (8)
Unemployment shock	1.6820 ***	0.1041 *	0.0488	0.0117 ***	0.0082 **	0.0101	0.0128 ***	0.0146 **
	(0.2981)	(0.0617)	(0.062)	(0.0044)	(0.0041)	(0.0066)	(0.0036)	(0.0073)
Observations	3,532,009	2,635,040	1,763,837	3,532,009	3,532,009	896,969	3,532,009	1,059,267
Outcome range	[0, 100]	[0, 100]	[0, 100]	{0, 1}	{0, 1}	{0, 1}	{0, 1}	{0, 1}
Outcome mean	12.47	8.39	7.61	0.30	0.37	0.41	0.47	0.53
Outcome standard deviation	24.79	5.30	4.84	0.46	0.48	0.49	0.50	0.50
Unemployment shock mean	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Suggests intermediary j internalizes information from k before passing to i.

Magnitudes around 5x greater than for second-degree connections, except for national outlook.

Preferences motivated by informed self-interest

Previous results suggest responses may be driven by sensitivity rather than decay.

Test for differential responses by nature of *i*-*k* tie:

$$\begin{aligned} Y_{iwoept} &= \alpha Shock_{kp't} + \beta Similar_{ikt} + \gamma\left(Shock_{kp't} \times Similar_{ikt}\right) \\ &\quad + \zeta_{wt} + \kappa_{ot} + \psi_{et} + \mu_{pt} + \varepsilon_{ikwoepp't}, \end{aligned}$$

Preferences motivated by informed self-interest

	Own unemployment expectation	Guess national unemployment rate	National unemployment rate expectation	Want more unemployment insurance	Government should support the poor	Support non-market based solutions	Intend to vote for left party	Voted for left party in 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Same two-digit industry as second-degree connection								
Unemployment shock	0.1796 *	0.0860 ***	0.0872 ***	0.0011	0.0018	0.0011	0.0015	0.0013
	(0.0923)	(0.0214)	(0.0317)	(0.0016)	(0.0016)	(0.0026)	(0.0017)	(0.0022)
Same industry	-1.3436 ***	0.0946 **	0.0486	-0.0068 **	-0.0007	-0.0040	0.0020	0.0044
	(0.2285)	(0.0429)	(0.0364)	(0.0033)	(0.0039)	(0.0064)	(0.0035)	(0.0058)
Unemployment shock × Same industry	0.5615 ***	-0.0030	0.0400	0.0076 **	-0.0005	0.0036	0.0068 **	0.0115 *
	(0.2063)	(0.0423)	(0.064)	(0.003)	(0.0032)	(0.0055)	(0.003)	(0.006)
Observations	140,509,875	105,142,551	69,271,133	140,509,875	140,509,875	35,367,324	140,509,875	41,432,206
Outcome range	[0, 100]	[0, 100]	[0, 100]	{0, 1}	{0, 1}	{0, 1}	{0, 1}	{0, 1}
Outcome mean	13.80	8.49	7.59	0.31	0.39	0.42	0.48	0.54
Outcome standard deviation	26.38	5.43	4.70	0.46	0.49	0.49	0.50	0.50
Unemployment shock mean	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Same occupation mean	0.36	0.37	0.37	0.36	0.36	0.35	0.36	0.36
Survey years unavailable		2010	2010, 2012			2011, 2012, 2013		2010, 2011
Panel B: Same one-digit occupation as second-degree connection								
Unemployment shock	0.2168 ***	0.0756 ***	0.0908 ***	0.0013	0.0009	0.0009	0.0035 **	0.0047 **
	(0.0762)	(0.0236)	(0.034)	(0.0016)	(0.0028)	(0.0028)	(0.0017)	(0.0022)
Same occupation mean	-0.7402 ***	0.1088 ***	0.0588 *	0.0000	-0.0079 *	-0.0079 *	0.0004	0.0068
	(0.1767)	(0.0363)	(0.035)	(0.0034)	(0.0048)	(0.0048)	(0.0029)	(0.0042)
Unemployment shock × Same occupation	0.3991 **	0.0390	0.0217	0.0062 **	0.0038	0.0038	-0.0021	-0.0033
	(0.1839)	(0.0364)	(0.0551)	(0.0029)	(0.0048)	(0.0048)	(0.003)	(0.0038)
Observations	140,509,875	105,142,551	69,271,133	140,509,875	140,509,875	35,367,324	140,509,875	41,432,206
Outcome range	[0, 100]	[0, 100]	[0, 100]	{0, 1}	{0, 1}	{0, 1}	{0, 1}	{0, 1}
Outcome mean	13.8011	8.4943	7.5943	0.3146	0.3893	0.4204	0.4799	0.5415
Outcome standard deviation	26.3811	5.4342	4.7005	0.4644	0.4876	0.4936	0.4996	0.4983
Unemployment shock mean	0.0185	0.0182	0.0179	0.0185	0.0185	0.0194	0.0185	0.0183
Same occupation mean	0.3922	0.3928	0.3953	0.3922	0.3922	0.3903	0.3922	0.3774
Survey years unavailable		2010	2010, 2012			2011, 2012, 2013		2010, 2011

National outlook affected equally, own concerns and preferences only affected by same industry. Suggest self-interest motivation.

Interpretation

Perceptions and preferences are influenced by unemployment shock information transmitted through peers.

Consistent with rational updating, all shocks equally influence national outlook.

Consistent with selfish preference formation, only shocks to friends of friends influence subjective concerns and policy and vote preferences.

Are voters updating too much?

- Systematic optimism about becoming unemployed?
- Could be a medium-term behavioral response such as anxiety?

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Conclusions

Conclusions

Unprecedented opportunity to construct networks over population.

Evidence of information transmission through peers that ultimately impacts economic beliefs, policy preferences and vote choice

How is information transmitted?

Context-specific? To post financial crisis debate? To Denmark?

Industry 1 digit classification

1: agriculture, fishery
2: industry
3: construction
4: trade and transport
5: information and communication
6: finance and insurance
7: real estate and rental service
8: service business
9: public administration, teaching, and health care
10: culture and other services

Occupation 1 digit classification

1: military
2: management
3: work that requires knowledge at the highest level within that field
4: work that requires knowledge at the intermediate level within that field
5: office work, customer service
6: service and sales
7: agriculture, fishery
8: craftsman
9: machine operator, installation, transportation
10: other manual work

Education 1 digit classification

1: primary school
2: prep school
3: regular high school
4: business high school
5: vocational basic
6: vocational practical training and main program
7: further education for skilled workers
8: short higher education
9: intermediate higher education
10: bachelor's degree
11: long higher education (university)
12: research